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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Bao, *et al.* Docket No.: TSM03-0927
Serial No.: 10/800,510 Art Unit: 2818
Filed: March 15, 2004 Examiner: Tu-Tu Ho
For: Semiconductor Device Having a Second Level of Metallization Formed over
a First Level with Minimal Damage to the First Level and Method

Mail Stop: Amendment
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Affidavit Filed Under 37 C.F.R. § 1.132

Dear Sir:

I, Tien-I Bao, do hereby state that:

1. My name is Tien-I Bao. I am a process engineer at Taiwan Semiconductor Manufacturing Company, Ltd. with six (6) years of experience in semiconductor manufacturing and processes.
2. I have a PhD from National Central University, Taiwan, R.O.C.
3. I have reviewed U.S. Pub No. 20040084680, issued to Ruelke, et al. ("Ruelke"). Ruelke discloses an etch stop layer 250 (paragraph 0035) that is formed over a metal feature 203 (paragraph 0033). Ruelke teaches that the etch stop layer can be patterned by etching.
4. Ruelke does not provide details regarding the etch process (paragraph 0049).

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5. Ruelke teaches that the etch stop layer 250 can range between 100 Å and 1,000 Å in thickness. Ruelke provides no teaching, however, to modify or in any way change the etch process parameters in accordance with the thickness of the etch stop layer. In other words, based upon the teaching of Ruelke, it would appear that the etch process would be the same whether the etch stop layer 250 was 100 Å or 1,000 Å, or any thickness in between.

6. Based upon my experience in semiconductor processing, I believe that the metallization layer underlying a 100 Å thick etch stop layer would be substantially damaged by any etch process used to pattern the 100 Å thick etch stop layer, which etch process would also be sufficient to pattern the etch stop layer with a 1,000 Å thickness.

7. Because Ruelke does not teach the specifics of the etch process, but merely says the etch stop layer 250 can be patterned with an etch and that it can range between 100 Å and 1,000 Å in thickness, I believe that the underlying metallization layer of Ruelke would be damaged by the etch process of Ruelke. I find no teaching or suggestion in Ruelke that would suggest, much less in an enabling fashion, that the underling metal would be substantially free of damage when the etch stop layer is less than 300 Å or about 100 Å.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Respectfully submitted,

Date: 11/02/05

Tien-I Bao
Tien-I Bao